the rejections on the grounds that there was no teaching in the art to form the claimed combinations and the cited references even when combined do not teach or suggest the claimed inventions. Initially, applicants make the following comments regarding independent claims 1, 8, 17, 20 and 23.

Regarding claim 1 applicants argued in their previous response that neither Hilbert nor Ciccarelli et al. disclose "a capacitor coupled across the power input and power return." The Office action now states, in part, that in Siwiak et al. "capacitors 126 and 206 in Figures 4 and 6 are coupled across the power input and the power return." Even with the addition of Siwiak et al., however, the cited references do not describe all of the elements of the claimed invention. For example, none of these references disclose "a first resistor having a first end coupled to the power input and a second end to couple to a power source; and a second resistor having a first end coupled to the power return and a second end to couple to a power source return" as claimed in claim 1.

Regarding claim 8 applicants argued in their previous response that neither Hilbert nor Ciccarelli et al. disclose "isolation means for isolating the charging means from a power source." The Office action now states, in part, that in Siwiak et al. "capacitors 126 and 206 can be applied across this logic circuit, they are considered as isolation means for isolating the charge means from a power source." However, the rejection still does not discuss where the "charge means" is disclosed in the references. Moreover, there is nothing in the art that discusses the need for isolating charge means from a power source as claimed. Hence, it would not have been obvious to combine the references in the manner suggested to provide the claimed invention.

Regarding claim 17 none of the references teach or suggest "circulating charge between the differential outputs through the capacitor."

Regarding claim 20 none of the references teach or suggest an inductor coupled to the power input of a differential circuit and a power source.

Regarding claim 23 none of the references teach or suggest "a current source having an output coupled to the differential circuit, an input, and a capacitor shunting the input."

For the above reasons and for other reasons discussed below, independent claims 1, 8, 17, 20 and 23 and the claims that depend on them are not obvious in view of the cited references. Accordingly, applicants hereby request reconsideration of claims 1 - 26. Applicants will now discuss the rejections of the claims in more detail.

Response to Rejection of Claim 1 under 35 U.S.C. 103(a)

Regarding claim 1, the Office action states:

> Hilbert discloses a circuit (Fig. 8), comprising: a logic circuit (420 of Fig. 8) having a power input and a power return; a capacitor (805 or 806 of Fig. 8; col. 11, line 21-col. 12, line 13); a first resistor (814 of Fig. 8) having a first end coupled to the power input and a second end to couple to a power source (col. 12, lines 26-32); and a second resistor (815 of Fig. 8) having a first end coupled to the power return and a second end to couple to a power source return (col. 12, line 33-col. 13, line 65; col. 14, lines 11-65).
>
> However, Hilbert does not specifically disclose a capacitor coupled across the power input and power return; and a first resistor having a first end coupled to the power input and a second end to couple to a power source.
>
> On the other hand, Ciccarelli et al, from the same field of endeavor, discloses an amplifier having an adjustable current source which can be controlled to provide the requisite level of performance at reduced current consumption. The current source

can be designed with active devices which are selected based on the logic of the control signals for ease of interface. The bias current is adjusted to provide the requisite level of performance while reducing power consumption (Figs. 3-5; col. 4, lines 40-67; col. 6, lines 13-col. 8, line 29; col. 9, line 25-col. 10, line 40; Figs. 11A-11B, col. 19, line 15-col. 20, line 65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Ciccarelli to the communication system of Hilbert in order to minimize power consumption.

Siwiak et al. discloses in Figure 4, an RF power amplifier 120 where a power supply voltage Vs is applied to the drain of FET 122, through an RF choke 123, and a capacitor 126 is disposed between the drain of the FET 122 and an impedance transformation network 129 (FIGS. 4-6; col. 3, line 1-col. 4, line 55; col. 5, lines 8-65). It is considered that the capacitors 126 and 206 in Figures 4 and 6 are coupled across the power input and the power return. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Siwiak to the modified system of Ciccarelli and Hilbert in order to minimize power consumption.

Applicants respectfully disagree with the contention that applying the techniques of Siwiak et al. and Ciccarelli et al. to the communication system of Hilbert provides the claimed invention.

None of these references disclose "a first resistor having a first end coupled to the power input and a second end to couple to a power source; and a second resistor having a first end coupled to the power return and a second end to couple to a power source return."

The resistors 814 and 815 of Hilbert connect to the signal outputs 821 and 826 and to NPN transistors 801 and 802 of the variable

phase shift network that receive differential signals 819 and 825. Hilbert column 11, lines 36 - 65.

Neither Ciccarelli et al. nor Siwiak et al. disclose a resistor structure similar to the claim language quoted above. Hence, even assuming there was motivation to combine these three references (which there is not) the combination does not provide the claimed invention.

None of these references disclose "a capacitor coupled across the power input and power return."

The capacitors 805 and 806 in Hilbert connect to the signal outputs 821 and 826 and to fixed current sources 800 and 807, and to NPN transistors 804 and 803 of the variable phase shift network that receive differential signals 819 and 825. Hilbert column 11, line 36 - column 12, line 13.

The adjustable current source as disclosed in Figures 5A, 5B, 11A and 11B of Ciccarelli et al. include a "capacitor 1598 [that] connects across the output of current source 1580 and analog ground."

In Siwiak et al. capacitor 206 connects to "ground." It does not connect, for example, to a "power return" connected such that "a second resistor having a first end coupled to the power return and a second end to couple to a power source return."

Capacitor 126, on the other hand, is not connected across (e.g., in parallel with) anything. Rather, capacitor 126 is connected between the circuits to its left and right in Figure 4 as noted in the Office action: "a capacitor 126 is disposed <u>between</u> the drain of the FET 122 and an impedance transformation network 129."

In summary, the asserted combination does not provide the claimed invention.

Regarding dependent claims 2-5, the Office action states:

> Hilbert as modified discloses a circuit (Fig. 8), comprising: a logic circuit (420 of Fig. 8) wherein the logic

circuit comprises a differential circuit; wherein the two logic gates each comprises an inverter (col. 11, lines 21-66).

Applicants respectfully disagree. Hilbert does not disclose a circuit having a differential circuit with resistors as claimed. Hilbert states at column 14, lines 30 - 37:

> In the preferred embodiment, the variable phase shift network 420 includes the first resistor 814 and the second resistor 815. The resistors 814 and 815 shown in series with r_e in FIG. 8 are optional and help correct for even order distortion that occurs on each emitter with large signal swings. This distortion is not a problem when the in-phase and quadrature outputs are taken differentially, since even order distortion will then cancel. (Underlining added.)

Hence, resistors 814 and 815 are not used when the inputs and outputs are differential because the resistors are not needed to correct for even order distortion. Thus, Hilbert does not teach or suggest the claimed differential circuit with resistors.

Regarding claims 7 and 16, the Office action states:

> Hilbert as modified discloses a circuit (Fig. 8), comprising: a logic circuit (420 of Fig. 8) wherein the CMOS inverters each comprises a p-channel transistor having a source coupled to the power input, a gate, and a drain, and an n-channel transistor having a source coupled to the power return, a gate coupled to the gate of the p-channel transistor to form an input node, and a drain coupled to the drain of the p-channel transistor to form output node (col. 11, line 21-col. 12, line 32), the differential circuit further having a differential input comprising the input nodes for each of the CMOS inverters,

and a differential output comprises the output nodes for each of the CMOS inverters (col. 13, line 3-col. 14, line 60).

Applicants respectfully disagree. Hilbert does not disclose a circuit having "a p-channel transistor having a source coupled to the power input, . . . and an n-channel transistor having a source coupled to the power return, a gate coupled to the gate of the p-channel transistor to form an input node, and a drain coupled to the drain of the p-channel transistor to form an output node" as claimed.

First, Hilbert does not disclose CMOS inverters. Second, the transistors of Hilbert are not connected in the manner claimed. For example, while the bases of Q1 and Q3 may be connected, Q1 and Q3 do not have "a drain coupled to the drain of the p-channel transistor to form an output node."

In summary, the cited references do not teach or suggest the claimed invention. Accordingly, applicants submit that independent claim 1 and claims 2 - 7 that depend on claim 1 are allowable.

Response to Rejection of Claim 8 under 35 U.S.C. 103(a)

Regarding claim 8, the Office action states:

> Hilbert discloses a circuit (Fig. 8), comprising: logic means (809 of Fig. 8) for performing a logic function (col. 11, line 21-col. 12, line 13); charge means (805 or 806 of Fig. 8) for storing a charge across the logic means; and isolation means (814 of Fig. 8; col. 12, line 33-col. 13, line 65; col. 14, lines 11-65).
>
> However, Hilbert does not specifically disclose an isolation means for isolating the charging means from a power source.

On the other hand, Ciccarelli et al, from the same field of endeavor, discloses an amplifier having an adjustable current source which can be controlled to provide the requisite level of performance at reduced current consumption. The current source can be designed with active devices which are selected based on the logic of the control signals for ease of interface. The bias current is adjusted to provide the requisite level of performance while reducing power consumption (Figs. 3-5; col. 4, lines 40-67; col. 6, lines 13-col. 8, line 29; col. 9, line 25-col. 10, line 40; Figs. 11A-11B, col. 19, line 15-col. 20, line 65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Ciccarelli to the communication system of Hilbert in order to minimize power consumption.

Siwiak et al. discloses in Figure 4, an RF power amplifier 120 where a power supply voltage Vs is applied to the drain of FET 122, through an RF choke 123, and a capacitor 126 is disposed between the drain of the FET 122 and an impedance transformation network 129 (FIGS. 4-6; col. 3, line 1-col. 4, line 55). Furthermore, the bias control logic circuit 310 has an input 312 for receiving input data on the power cutback required, and four outputs 328, 330, 332 and 334, coupled to resistors 308, 322, 324, and 33, respectively, for providing the bias voltages required to bias one or two stages of amplification (col. 5, lines 8-65). Since the capacitors 126 and 206 can be applied across this logic circuit, they are considered as isolation means for isolating the charge means from a power source. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Siwiak to the modified system of Ciccarelli and Hilbert in order to minimize power consumption.

Even with the addition of Siwiak et al., the cited combination still does not provide the claimed invention.

As discussed above, Hilbert does not disclose "charge means for storing a charge across the logic means." Capacitors 805 and 806 in Hilbert connect to the signal outputs 821 and 826 and to fixed current sources 800 and 807, and to NPN transistors 804 and 803 of the variable phase shift network that receive differential signals 819 and 825. Hilbert column 11, line 36 - column 12, line 13. Hence, the capacitors are not across the logic means 809.

The Office action does not discuss whether Ciccarelli et al. provides the claimed charge means.

Regarding Siwiak et al. the Office action states in the rejection of claim 1 that "It is considered that the capacitors 126 and 206 in Figures 4 and 6 are coupled across the power input and the power return." Hence, it appears that Siwiak et al. is considered by the Office to provide the charge means.

However, none of these references teach or suggest "isolation means for isolating the charging means from a power source." The Office action recognizes that Hilbert does not disclose this feature and cites nothing from Ciccarelli et al. regarding this feature.

The lone reference in the Office action to this limitation regards Siwiak et al.: "Since the capacitors 126 and 206 can be applied across this logic circuit, they are considered as isolation means for isolating the charge means from a power source."

However, given that the Office action apparently alleges that capacitors 126 and 206 are the claimed "charge means" they cannot also be the claimed "isolation means." Accordingly, the cited combination does not provide the claimed invention.

Moreover, none of the references discuss the need for isolating charge means from a power source as claimed. In addition, there is no teaching or suggestion regarding how the cited references could be combined to accomplish such a result. Hence, it would not have been

obvious to combine the references in the manner suggested to provide the claimed invention.

Regarding claims 9-15, the Office action states:

> Hilbert as modified discloses a circuit (Fig. 8), comprising: a logic circuit (420 of Fig. 8) wherein the charge means comprises a capacitor (805 or 806 of Fig. 8); and the isolation means comprises a first resistor (814 of Fig. 8) to couple a first end of the capacitor to the power source (col. 12, lines 26, 32), a second resistor (815 of Fig. 8) to couple a second end of the capacitor to a return line for the power source (col. 12, line 33-col. 13, line 65; col. 14, lines 11-65).
>
> Claims 11-15 contain similar limitations addressed in claims 2-7, and therefore are rejected under a similar rationale.

Applicants respectfully disagree. The reference do not contain any language that would suggest configuring the capacitors or resistors of Hilbert in the claimed manner.

In summary, the cited references do not teach or suggest the claimed invention. Accordingly, Applicants submit that independent claim 8 and claims 9 - 16 that depend on claim 8 are allowable.

Response to Rejection of Claim 17 under 35 U.S.C. 103(a)

Regarding claim 17, the Office action states:

> Hilbert discloses a method (Fig. 3 and Fig. 8) of suppressing noise during the switching of a differential circuit having differential inputs and outputs, comprising: charging a capacitor (805 or 806 of Fig. 8) through a resistor (814 of Fig. 8; col. 11, line 21-col. 12, line 13); applying a signal transition at the differential inputs (col. 9, line 22-col. 10,

line 66); and circulating charge between the differential outputs (col. 12, lines 26-32); compensating for loss of the charge on the capacitor during the circulation of charge (col. 12, line 33-col. 13, line 65; col. 14, lines 11-65).

However, Hilbert does not specifically disclose the features of circulating charge between the differential outputs through the capacitor; compensating for loss of the charge on the capacitor during the circulation of charge by recharging the capacitor through the resistor.

On the other hand, Ciccarelli et al., from the same field of endeavor, discloses an amplifier having an adjustable current source which can be controlled to provide the requisite level of performance at reduced current consumption. The current source can be designed with active devices which are selected based on the logic of the control signals for ease of interface. The bias current is adjusted to provide the requisite level of performance while reducing power consumption (Figs. 3-5; col. 4, lines 40-67; col. 6, lines 13-col. 8, line 29; col. 9, line 25-col. 10, line 40; Figs. 11A-11B, col. 19, line 15-col. 20, line 65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Ciccarelli to the communication system of Hilbert in order to minimize power consumption.

Siwiak et al. discloses in Figure 4, an RF power amplifier 120 where a power supply voltage Vs is applied to the drain of FET 122, through an RF choke 123, and a capacitor 126 is disposed between the drain of the FET 122 and an impedance transformation network 129 (FIGS. 4-6; col. 3, line 1-col. 4, line 55). Furthermore, the bias control logic circuit 310 has an input 312 for receiving input data on the power cutback required, and four outputs 328, 330, 332 and 334, coupled to resistors 308, 322, 324, and 33, respectively, for providing the

bias voltages required to bias one or two stages of amplification (col. 5, lines 8-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Siwiak to the modified system of Ciccarelli and Hilbert in order to minimize power consumption.

The combination of Hilbert, Ciccarelli et al. and Siwiak et al. does not provide the claimed invention.

Hilbert does not teach or suggest any techniques or structure for accomplishing noise suppression. This subject is never addressed by Hilbert. Hence, there would not have been a motivation to combine Hilbert with any other references for such a purpose.

Moreover, none of the references address the subject of "circulating charge between the differential outputs through the capacitor." The Office action recognizes that Hilbert does not disclose this feature and cites nothing from Ciccarelli et al. or Siwiak et al. regarding this feature. Ciccarelli et al. or Siwiak et al. do not even discuss differential circuits, much less how charge could be circulated through such a circuit. Accordingly, applicants submit that this rejection should be withdrawn.

Regarding claim 19, the Office action states:

> Hilbert as modified discloses a method (Fig. 8) of suppressing noise during the switching of a differential circuit having differential inputs and outputs (col. 9, line 22-col. 10, line 66), comprising clocking the differential circuit after the transition of the signal at the differential output, the circulation of the charge being initiated by clocking the differential circuit, the resistor and capacitor having a time constant that is less than half the clocking frequency (col. 7, line 28-col. 8, line 67).

Neither of the references discusses "circulation of the charge being initiated by clocking the differential circuit" or "resistor and capacitor having a time constant that is less than half the clocking frequency."

In summary, the cited references do not teach or suggest the claimed invention. Accordingly, Applicants submit that independent claim 17 and claims 18 - 19 that depend on claim 17 are allowable.

Response to Rejection of Claim 20 under 35 U.S.C. 103(a)

Regarding claim 20, the Office action states:

> Hilbert discloses an integrated circuit (Fig. 4 and Fig. 8), comprising: a differential circuit having a power input (col. 6, lines 10-65); the differential circuit further comprises a power return (col. 7, line 28-col. 8, line 67; col. 11, line 21-col. 12, line 13).
>
> However, Hilbert does not specifically disclose an inductor having a first end coupled to the power input and a second end to couple to a power source; and a second inductor having a first end coupled to the power return and a second end to couple to a power source return.
>
> On the other hand, Ciccarelli et al, from the same field of endeavor, discloses an amplifier having an adjustable current source which can be controlled to provide the requisite level of performance at reduced current consumption. The current source can be designed with active devices which are selected based on the logic of the control signals for ease of interface. The bias current is adjusted to provide the requisite level of performance while reducing power consumption (Figs. 3-5; col. 4, lines 40-67; col. 6, lines 13-col. 8, line 29; col. 9, line 25-col. 10, line 40; Figs. 11A-11B, col. 19, line 15-col. 20, line 65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the

technique of Ciccarelli to the communication system of Hilbert in order to minimize power consumption.

Siwiak et al. discloses in Figure 4, an RF power amplifier 120 where a power supply voltage Vs is applied to the drain of FET 122, through an RF choke 123, and a capacitor 126 is disposed between the drain of the FET 122 and an impedance transformation network 129 (FIGS. 4-6; col. 3, line 1-col. 4, line 55; col. 5, lines 8-65). It is considered that the capacitor 206 and inductor 204 in Figure 6 are coupled across the power input and the power source. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Siwiak to the modified system of Ciccarelli and Hilbert in order to minimize power consumption.

None of the references teach or suggest an inductor coupled to the power input of a differential circuit and a power source. The Office action acknowledges that Hilbert does not disclose this feature. Moreover, Ciccarelli et al. or Siwiak et al. do not even discuss differential circuits, much less that an inductor could be coupled to such a circuit.

Moreover, it would not have been obvious combine Siwiak et al. with Hilbert. The inductor 204 in Siwiak et al. is part of "a harmonic band network" is used to provide a "harmonically tuned" high efficiency amplifier. Siwiak et al., column 4, lines 44 - 55. In contrast, Hilbert relates to a phase quadrature signature generator having a variable phase shift network. There is no teaching or suggestion regarding why the circuit of Siwiak et al. should be used in Hilbert, much less how such a combination could be accomplished.

In summary, the claimed invention would not have been obvious to one skilled in the art. Accordingly, Applicants submit that

independent claim 20 and claims 21 - 22 that depend on claim 20 are allowable.

Response to Rejection of Claim 23 under 35 U.S.C. 103(a)

Regarding claim 23, the Office action states:

Hilbert discloses a circuit (Fig. 8), comprising: a differential circuit; and a current source (807, 808, 813 of Fig. 8) having an output coupled to the differential circuit; and the current source comprise a transistor (801-804 of Fig. 8) having a drain coupled to the differential circuit, a gate and a source, the capacitor being coupled between the gate and the source (col. 11, line 21-col. 12, line 62; col. 13, line 39-col. 14, line 60).

However, Hilbert does not specifically disclose a current source having an output coupled to the differential circuit, an input, and a capacitor shunting the input.

On the other hand, Ciccarelli et al, from the same field of endeavor, discloses an amplifier having an adjustable current source which can be controlled to provide the requisite level of performance at reduced current consumption. The current source can be designed with active devices which are selected based on the logic of the control signals for ease of interface. The bias current is adjusted to provide the requisite level of performance while reducing power consumption (Figs. 3-5; col. 4, lines 40-67; col. 6, lines 13-col. 8, line 29; col. 9, line 25-col. 10, line 40; Figs. 11A-11B, col. 19, line 15-col. 20, line 65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Ciccarelli to the communication system of Hilbert in order to minimize power consumption.

Siwiak et al. discloses in Figure 4, an RF power amplifier 120 where a power supply voltage Vs is applied to the drain of

FET 122, through an RF choke 123, and a capacitor 126 is disposed between the drain of the FET 122 and an impedance transformation network 129 (FIGS. 4-6; col. 3, line 1-col. 4, line 55; col. 5, lines 8-65). It is considered that the capacitor 206 and inductor 204 in Figure 6 are coupled across the power input and the power return. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Siwiak to the modified system of Ciccarelli and Hilbert in order to minimize power consumption.

None of the references teach or suggest "a current source having an output coupled to the differential circuit, an input, and a capacitor shunting the input." For example, the current controller 809 of Hilbert and the current sources 1580, 1581 and 1583 in Ciccarelli et al. do not have "a capacitor shunting the input." Siwiak et al. does not discuss differential circuits, much less that the claimed current source could be coupled to such a circuit.

Moreover, it would not have been obvious combine Siwiak et al. with Hilbert. The capacitor 206 in Siwiak et al. is part of "a harmonic band network" is used to provide a "harmonically tuned" high efficiency amplifier. Siwiak et al., column 4, lines 44 - 55. In contrast, Hilbert relates to a phase quadrature signature generator having a variable phase shift network. There is no teaching or suggestion regarding why the circuit of Siwiak et al. should be used in Hilbert, much less how such a combination could be accomplished.

In summary, the cited references do not teach or suggest the claimed invention. Accordingly, Applicants submit that independent claim 23 and claims 24 - 26 that depend on claim 23 are allowable.

SUMMARY

In view of the above, Applicants submit that pending claims are in condition for allowance. Accordingly, Applicants request that this application be passed to issue.

Respectfully submitted,

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SDB/dlf

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